The Mars Pathfinder Mission

M. P. Golombek (JPL)

The Mars Pathfinder mission is a Discovery class mission that will place a small lander and rover on the surface of Mars on July 4, 1997. The Pathfinder flight system is a single small lander, packaged within an aeroshell and backcover with a back-pack-style cruise stage. The vehicle will be launched, fly independently to Mars, and enter the atmosphere directly on approach behind the aeroshell. The vehicle is slowed by a parachute and 3 small solid rockets before landing on inflated airbags. Petals of a small tetrahedron shaped lander open up, to right the vehicle. The lander is solar powered with batteries and will operate on the surface for up to a year, downlinking data on a high-gain antenna. Pathfinder will be the first mission to use a rover, with 3 imagers and an alpha proton X-ray spectrometer, to characterize the rocks and soils in a landing area over hundreds of square meters on Mars, which will provide a calibration point or "ground truth" for orbital remote sensing observations. The rover (includes a series of technology experiments), the instruments (including a stereo multispectral surface imager on a pop up mast and an atmospheric structure instrument-surface meteorology package) and the telemetry system will allow investigations of: the surface morphology and geology at meter scale, the petrology and geochemistry of rocks and soils, the magnetic properties of dust, soil mechanics and properties, a variety of atmospheric investigations and the rotational and orbital dynamics of Mars. Landing downstream from the mouth of a giant catastrophic outflow channel, Ares Vallis, offers the potential of identifying and analyzing a wide variety of crustal materials, from the ancient heavily cratered terrain, intermediate-aged ridged plains and reworked channel deposits, thus allowing first-order scientific investigations of the early differentiation and evolution of the crust, the development of weathering products and early environments and conditions on Mars.

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Paper presented by Matthew P. Golombek
Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive
Pasadena CA 91109-8099 USA
Phone: 818-393-7948
Fax: 818-393-1227
Email: mgolombek@jpl.nasa.gov

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